EXHIBIT 1

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ADVANCED CODING TECHNOLOGIES LLC,	§	
	§	
Plaintiff,	§	
	§	
v.	§	Civil Action No. 2:22-cv-00501-JRG
	§	(Lead Case)
LG ELECTRONICS INC. and LG ELECTRONICS U.S.A., INC.,	§	
	§	
Defendants.	§	

CLAIM CONSTRUCTION ORDER

In these consolidated patent cases, Advanced Coding Technologies LLC (ACT) sued LG Electronics and Samsung for infringement of six patents relating to video data encoding or play-back. ACT and Samsung[1] dispute the scope of 12 terms or phrases from three of the patents—U.S. Patents 8,090,025, 9,445,041, and 10,218,995.[2] Having considered the parties' briefing and arguments of counsel during a May 16, 2024, hearing, the Court resolves the disputes as follows.

I. BACKGROUND

A. U.S. Patent 8,090,025

The '025 Patent relates to coding and decoding video, particularly at the border of video blocks composing a picture. Prior-art motion-compensation techniques divided the picture into

[1] ACT and LG have since notified the Court of settlement, so these claim-construction proceedings concern only ACT and Samsung.

[2] The parties' briefing also addressed four terms from U.S. Patent 8,139,150, but ACT has since notified the Court it no longer asserts the claim in which those terms appear. *See* Notice Focusing Patent Claims, Dkt. No. 132.

rectangular blocks of pixels and then detected the degree of motion by assuming all pixels in the block "move" in the same direction. '025 Patent at 1:35–40. This can result in a mismatch of motion-vector data borders of adjacent blocks that manifests as distortion in the overall image. *Id.* at 1:40–54.

At the time of invention, there were "smoothing" methods to the "discontinuous situation" on block borders, such as use of a filter. '025 Patent at 1:55–63. But those techniques come with tradeoffs. As the patent explains, too little smoothing doesn't address the problem, and too much smoothing decreases the quality of other aspects of the picture. *Id.* at 2:4–10.

Rather than use a "smoothing" procedure, the patent teaches producing a "predictive picture," which maintains continuity on the border. The method produces a residual picture that is the difference between the predictive picture and the actual picture. The method then determines a "boundary condition" at the border and generates an estimated video signal that satisfies Poisson's Equation, which is a type of partial differential equation often used to describe a change in physical phenomena over space and/or time. *See generally* '025 Patent at 2:44–3:3.

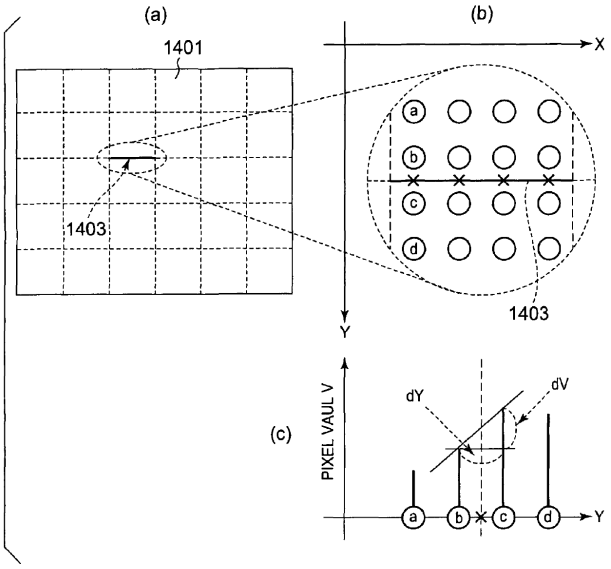

FIG. 15

Figure 15 (above) of the patent shows part of the method in practice. One block has pixels "a" and "b," and the other block has pixels "c" and "d." Each pixel has some value of a pixel characteristic, such as luminance or chrominance. The embodiment interpolates the value of a hypothetical pixel on the border between the blocks by obtaining the gradient dY/dV. From this gradient, the method produces a "predictive picture" by generating an estimated video signal in each rectangular zone in the picture that satisfies Poisson's Equation. A residual picture—that is, the difference between the picture to be encoded and the predicted picture—is then produced and coded. *See generally* '025 Patent at 10:46–65.

The parties present disputes about three terms from the '025 Patent. First, they dispute the scope of "boundary condition." Second, they dispute whether meeting a requirement that a video signal "satisfies Poisson's Equation" requires the accused device to make a mathematical calculation. Finally, Samsung challenges a phrase from the claims as indefinite because it allegedly has more than one reasonable interpretation to a skilled artisan.

B. U.S. Patent 10,218,995

The '995 Patent relates to improving the efficiency of encoding video. The patent describes various other general methodologies with that aim, such as those specified by the MPEG-1, -2 and -4 standards, but those methodologies have drawbacks that reduce coding efficiency, particularly if an insufficient code rate is used. *See* '995 Patent at 2:15–20 (noting the failure to use a sufficient code rate can degrade the quality of predictive pictures); *see also id.* at 2:30–36 (same).

The patent teaches "super-resolution enlargement" of standard resolution images to make use of additional information previously unusable at lower resolutions. *See* '995 Patent at 39:31–35 (explaining "the process for the first super-resolution enlargement is allowed to process information on spatial and temporal frequency components that have been potentially contained in input

moving pictures but unable to express to a sufficient degree by the standard resolution"). After enlargement, the signals are returned to standard resolution. Ultimately, the system outputs a multiplexed bit stream that includes a first sequence of encoded bits representing pictures input with the standard resolution and a second sequence of encoded bits representing super-resolution enlarged signals. A decoder ultimately receives the bitstreams and decodes them into a variety of outputs of various sizes and resolutions. *Id.* at [57].

The parties dispute four terms from Claims 2–4, each of which is an independent claim focused on decoding. For example, Claim 2 is directed to "[a] moving picture decoding system," whereas Claim 3 concerns "[a] moving picture decoding method." '995 Patent at 67:1, 67:53. Similarly, Claim 4 recites "[a] recording medium storing a moving picture decoding program." *Id.* at 68:42–43. In these claims, the parties dispute the scope of "prescribed," "standard resolution," "decoding with an extension of the standard resolution," and "super-resolution enlarged decoded pictures."

C. U.S. Patent 9,445, 041

The '041 Patent relates to playing back video at different frame rates than the frame rate at which the video was generated. '041 Patent at 1:20–24. For example, although 30 frames per second (fps) and 60 fps are common frame rates for recording, higher frame rates like 300 fps might be used for quicker motion. Alternatively, much lower frame rates might be used for time-lapse recording. Some devices, however, only have one playback frame rate and some displays have limited playback speeds. *See generally id.* at 1:32–2:6.

Although prior art provides some solutions to this problem, those solutions generally require the user to set the playback frame rate and playback speed when the image is being recorded. *See generally* '041 Patent at 2:30–65. In contrast, the patent teaches an apparatus and method that

allows video generated at one frame rate to be easily played back at a different frame rate and speed, without the need to know the intended playback rate and speed at the time the video was recorded. *See id.* at 3:1–11.

The disputes from the '041 Patent come from terms in Claim 1, which recites:

> 1. A moving image data processing apparatus comprising:
>
> **a moving image data input unit** configured to be input of first moving image data generated at a first frame rate and second image data generated at a second frame rate that is different from the first frame rate;
>
> **an input frame rate specification unit** configured to specify
>
> the first frame rate of the first moving image data and the second frame rate of the second moving image data,
>
> the first and second moving image data having been input into the moving image data input unit;
>
> **an output frame rate specification unit** configured to specify
>
> output frame rate of the first moving image data and
>
> output frame rate of the second moving image data that have been input into the moving image data input unit;
>
> **a playback speed specification unit** configured to specify a same playback speed for the first moving image data and the second moving image data;
>
> **a frame rate conversion unit** configured to
>
> change a frame rate of the first moving image data based on the first frame rate, the output frame rate, and the play-back speed, and
>
> change a frame rate of the second moving image data based on the second frame rate, the output frame rate, and the playback speed; and
>
> a moving image data output unit that outputs the first and second moving image data whose frame rates have been converted by the frame rate conversion unit.

'041 Patent at 19:52–67 (disputed terms in bold). The parties agree each of the first five limitations are means-plus-function terms, but disagree as to the recited functions and corresponding structures.

II. GENERAL LEGAL STANDARDS

A. Generally

"[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). As such, if the parties dispute the scope of the claims, the court must determine their meaning. *See, e.g.*, *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1317 (Fed. Cir. 2007) (Gajarsa, J., concurring in part); *see also Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996), *aff'g*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc).

Claim construction, however, "is not an obligatory exercise in redundancy." *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Rather, "[c]laim construction is a matter of [resolving] disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims . . . ." *Id.* A court need not "repeat or restate every claim term in order to comply with the ruling that claim construction is for the court." *Id.*

When construing claims, "[t]here is a heavy presumption that claim terms are to be given their ordinary and customary meaning." *Aventis Pharm. Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citing *Phillips*, 415 F.3d at 1312–13). Courts must therefore "look to the words of the claims themselves . . . to define the scope of the patented invention." *Id.* (citations omitted). The "ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips*, 415 F.3d at 1313. This "person of ordinary

skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.*

Intrinsic evidence is the primary resource for claim construction. *See Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) (citing *Phillips*, 415 F.3d at 1312). For certain claim terms, "the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Phillips*, 415 F.3d at 1314; *see also Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) ("We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history."). But for claim terms with less-apparent meanings, courts consider "those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean . . . [including] the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Phillips*, 415 F.3d at 1314.

B. Means-Plus-Function Claiming[3]

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112 ¶ 6 (pre-AIA); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc

[3] Only the '041 Patent concerns the construction of means-plus-function terms. Because that patent has an effective filing date before the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3, 125 Stat. 284, 285-93 (2011), the Court refers to the pre-AIA version of the statute.

in relevant portion). Under 35 U.S.C. § 112 ¶ 6, a structure may be claimed as a "means . . . for performing a specified function," and an act may be claimed as a "step for performing a specified function." *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002). When it applies, § 112 ¶ 6 limits the scope of the functional term "to only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof." *Williamson*, 792 F.3d at 1347.

But § 112 ¶ 6 does not apply to all functional claim language. There is a rebuttable presumption that § 112 ¶ 6 applies when the claim language includes "means" or "step for" terms, and a rebuttable presumption it does *not* apply in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. These presumptions stand or fall according to whether one of ordinary skill in the art would understand the claim with the functional language to denote sufficiently definite structure or acts for performing the function in the context of the entire specification. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (noting § 112 ¶ 6 does not apply when "the claim language, read in light of the specification, recites sufficiently definite structure" (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349; *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014))); *Masco Corp.*, 303 F.3d at 1326 (noting § 112 ¶ 6 does not apply when the claim includes an "act" corresponding to "how the function is performed"); *Personalized Media Commc'ns, LLC v. I.T.C.*, 161 F.3d 696, 704 (Fed. Cir. 1998) (noting § 112 ¶ 6 does not apply when the claim includes "sufficient structure, material, or acts within the claim itself to perform entirely the recited function . . . even if the claim uses the term 'means.'" (quotation marks and citation omitted)).

Construing a means-plus-function limitation involves multiple steps. "The first step . . . is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced*

Cardiovascular Sys., Inc., 248 F.3d 1303, 1311 (Fed. Cir. 2001).

> The first step in construing such a limitation is a determination of the function of the means-plus-function limitation. The next step is to determine the corresponding structure described in the specification and equivalents thereof. Structure disclosed in the specification is corresponding structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.

Id. (citations and quotations omitted). The corresponding structure "must include all structure that actually performs the recited function." *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005). But § 112 does not permit "incorporation of structure from the written description beyond that necessary to perform the claimed function." *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

"[S]tructure can be recited in various ways, including [by using] 'a claim term with a structural definition that is either provided in the specification or generally known in the art,' or a description of the claim limitation's operation and 'how the function is achieved in the context of the invention.'" *Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1366 (Fed. Cir. 2022) (quoting *Apple, Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1299 (Fed. Cir. 2005)). For § 112, ¶ 6 limitations implemented by a programmed general-purpose computer or microprocessor, the corresponding structure described in the patent specification must usually include an algorithm for performing the function. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). In that case, the corresponding structure is not a general-purpose computer but rather the special-purpose computer programmed to perform the disclosed algorithm. *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

C. Indefiniteness

"[A] patent is invalid for indefiniteness if its claims, read in light of the specification

delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc*., 572 U.S. 898, 901 (2014). The claims "must be precise enough to afford clear notice of what is claimed" while recognizing that "some modicum of uncertainty" is inherent due to the limitations of language. *Id.* at 908.

"Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017). And in the context of § 112 ¶ 6, "[t]he party alleging that the specification fails to disclose sufficient corresponding structure must make that showing by clear and convincing evidence." *TecSec, Inc. v. IBM*, 731 F.3d 1336, 1349 (Fed. Cir. 2013) (quoting *Budde v. Harley-Davidson, Inc*., 250 F.3d 1369, 1380–81 (Fed. Cir. 2001)).

III. THE LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art is the skill level of a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In resolving the appropriate level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field. *Id.* Importantly, "[a] person of ordinary skill in the art is also a person of ordinary creativity, not an automaton." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

Here, ACT suggests a skilled artisan would have had "(1) a Bachelor of Science degree in an academic discipline emphasizing the design of electrical, computer, or software technologies; and (2) at least two years of industry experience in digital video processing, or a related field." Dkt. No. 97 at 1 (citing Kalva Decl., Dkt. No. 97-8 at 10 (¶ 28)). According to Samsung, a skilled artisan "would have had (1) at least a bachelor's degree in electrical engineering, computer science,

computer engineering, or a related field, and (2) at least two years of industry experience in digital video processing, or a related field." Hamami Decl., Dkt. No. 97-9 ¶¶ 101, 160; *see also* Traynor Decl., Dkt. No. 97-11 ¶ 20 (opining a skilled artisan "would have, for example, a bachelor's degree in computer science, electrical engineering, or similar discipline that provides a familiarity with digital video processing, data encoding, and [in] particular the use of frames in the encoding process, such that the encoded data has an associated 'frame rate'"). Samsung concludes "[t]he minor differences in the experts' opinions on the level of skill are not material to the claim construction disputes in this brief." Dkt. No. 105 at 1 n.1. ACT does not dispute that conclusion, and the Court agrees with it.

IV. THE DISPUTED TERMS

A. "boundary condition" ('025 Patent, Claims 6–7, 10)

ACT's Construction	Samsung's Construction
"data pertaining to the pixels at the boundary of a block"	"a gradient of a video signal on a straight edge of a rectangular block"

The claims require obtaining a "boundary condition" between adjacent rectangular zones of a moving picture. '025 Patent at 34:3–6. The parties dispute whether the "boundary condition" must be a gradient, such as shown in Figure 15(c), or whether it can be more general data.

Samsung's construction is based on its expert's opinion and four quotations from the specification. Dkt. No. 105 at 2. It emphasizes "the specification consistently refers to gradients as boundary conditions, and vice versa." *Id.* Samsung's expert opines that only gradients could be used to compute the boundary conditions because only gradients can satisfy Poisson's Equation, which the claims also require. Hemami Decl., Dkt. No. 97-9 ¶ 108. ACT, however, asserts Samsung's construction is too limiting, and notes the specification describes using gradients only

"preferably." Dkt. No. 97 at 6.

The Court generally agrees with Samsung. A skilled artisan would read the specification as equating "a gradient of a video signal" with "a boundary condition." *See, e.g.*, '025 Patent at 13:65–67 ("A gradient of a video signal, or a boundary condition, is expressed with DCT series so that it can be treated in the frequency domain."); *see also* Hemami Decl., Dkt. No. 97-9 ¶ 108 (concluding a skilled artisan would have understood, in the context of the patent, that a boundary condition must be a gradient). This aligns with the patent's purpose of minimizing or eliminating discontinuity of visible characteristics, like luminescence, near the borders of blocks. Tellingly, ACT does not explain any other way for determining the value at the boundary of a block.[4] Accordingly, the Court construes "boundary condition" as "gradient data pertaining to the pixels at the boundary of a block."[5]

B. "[an estimated video signal] that satisfies Poisson's Equation" ('025 Patent, Claims 6–7, 10)

ACT's Construction	Samsung's Construction

[4] ACT's expert cites a technical paper allegedly using an ordinary meaning of "boundary conditions" that does not require a gradient. *See* Kalva Decl., Dkt. No. 97-9 ¶ 35 (quoting Jingning Han et al., *A Technical Overview of AV1*, 109 PROCEEDINGS OF THE IEEE 1435, 1453 (2021), *available at* https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9363937). But that reference uses "boundary conditions" to define the limits within which a solution to the stated problem can be found. Specifically, the paper notes the boundary conditions outside of which the deblocking filter at the crux of the described solution is disabled. *Id.* While this is an "ordinary meaning" of "boundary conditions" in some contexts, it is not how the patent uses the term and does not undercut Samsung's position that a "boundary condition" must be a "gradient."

[5] At the hearing, the parties accepted this construction.

"[an estimated video signal . . .] where the Laplacian of the estimated video signal 'u' may be represented as an expression of 'K_j,' a source term, based on boundary condition(s)"	"[an estimated video signal . . .] that makes the equation $\Delta u_j = K_j$ true, where 'u' is the estimated signal in a block, 'K_j' is a source term, and Δu_j is a Laplacian of the estimated signal 'u'" Alternatively, indefinite.

The claims recite "generating an estimated video signal in each rectangular zone in the picture to be coded, that satisfies Poisson's Equation." *See, e.g.*, '025 Patent at 34:16–19. "Poisson's equation is a type of partial differential equation," which "are most commonly used to describe physical phenomena in which a measurable physical quantity varies over space and/or time." Hemami Decl., Dkt. No. 97-9 ¶¶ 116–17.

The parties don't dispute the equation or its terms. Rather, they dispute whether "satisfies Poisson's Equation" requires a calculation by the accused instrumentality to infringe the claims. *See* Dkt. No. 108 at 2 (asserting "Defendants attempt to further limit the claims beyond the words of its proposed construction to require a 'calculation'").

To the extent Samsung suggests a calculation is required, the Court disagrees. The claim language simply characterizes the generated estimated video signal. It does not, however, require calculations or verification that Poisson's Equation is satisfied. Of course, those calculations may be required to prove infringement, but, as Samsung suggests, satisfying Poisson's Equation simply means the estimated signal makes the equation true. *See* Dkt. No. 105 at 4 (noting "the patent constrains the resulting signal, not the manner in which the signal is generated"). That could happen either if the signal is generated and calculated in advance to satisfy Poisson's Equation, or by

chance.[6] Either of those would fall within the scope of this limitation. With that guidance, the Court construes this term as "[an estimated video signal] for which Poisson's Equation is true."

C. "the input signal being obtained by multiplexing a coded bitstream obtained by predictive coding, border motion-vector data and post-quantization data obtained by quantization in the predictive coding" ('025 Patent, Claims 6–7, 10)

ACT's Construction	Samsung's Construction
"the input signal being obtained by predictive coding (1) border motion vector data, and (2) post-quantization data obtained by quantization in the predictive coding" (Dkt. No. 108 at 3)	Indefinite

Samsung asserts this claim is indefinite based on ambiguous grammar and punctuation that, as a result, leads to three possible interpretations. First, a skilled artisan might understand this limitation to require multiplexing (1) the coded bitstream, (2) border motion-vector data, and (3) post-quantization data obtained by quantization in the predictive code. Dkt. No. 105 at 7. Second, the input signal might be only the coded bitstream, which in turn comprises border motion-vector data and post-quantization data. *Id.* Third, the input signal could be the result of multiplexing (1) a coded bitstream, obtained by predictive coding, that comprises motion-vector data and parameter data; (2) border motion vector-data; and (3) post-quantization data. *Id.* at 7–8.

According to ACT, there is only one reasonable interpretation. "The input signal is obtained by multiplexing a coded bitstream obtained by predictive coding (1) border motion vector data, and (2) post-quantization data obtained by quantization in the predictive coding." Dkt. No. 108 at 3. ACT says the patent explicitly describes the process. Dkt. No. 97 at 10 (citing '025 Patent at

[6] For example, a carpenter who crafts a tabletop 10 feet long and 5 feet wide would satisfy a claim limitation directed to a tabletop that satisfies the equation $L = 2 \times W$, even if he never bothered to make that calculation.

16:38–67 and 17:63–18:15).

The limitation's language is clumsy, likely because it is based on a Japanese application and resulting translation, but it is not indefinite in light of the specification. Figure 1 shows the entropy encoder 113 accepting data from two sources—the quantizer 108 and the zone-border motion estimator 118. *See* '025 Patent at fig.1. The specification then explains "the entropy encoder 113 receives at least the post-quantization data from the quantizer 108 and the border motion-vector data from the zone-border motion estimator 118 and performs entropy coding (step S114), thus generating coded bit strings." *Id.* at 16:39–43. And "[t]he multiplexer 114 receives the bit strings from the entropy encoder 113 and multiplexes them based on the specific syntactic structure (step S115)." *Id.* at 16:60–63. This aligns with the second of Samsung's three proposed "reasonable interpretations."

Samsung nonetheless says that interpretation gives rise to doubt because the claims require decoding the data into, in addition to the border motion-vector data and post-quantization data, "'ordinary motion-vector data' and 'parameter data.'" Dkt. No. 105 at 7. But even if accurate, that only means the claim is silent as to how the "ordinary motion-vector data" and "parameter data" are included in the input signal. In other words, that alone does not create any uncertainty as to how the input signal is obtained and, in addition to the recited "multiplexing," the claim does not preclude the input signal having other types of data. In fact, the specification shows as much, explaining "[t]he entropy encoder 113 may also perform entropy coding to several types of parameter data . . . received from the respective component parts of the coding apparatus." '025 Patent at 16:43–46. So do the claims. *See id.* at 33:25–27 (reciting, in Claim 4, "an entropy coding program code to perform entropy coding, *at least*, to the post-quantization data and the border motion-vector data, thus generating coded bit strings" (emphasis added)).

Moreover, Samsung's first and third interpretations are not reasonable. Regarding the latter, Samsung admits that interpretation "is inconsistent with the specification's description of the contents of the 'coded bitstream.'" Dkt. No. 105 at 8. And regarding the former, Samsung says that interpretation would require multiplexing a coded bitstream of border motion-vector data and post-quantization data bit strings with more border motion-vector and post-quantization data. While that may be technically possible, it serves no purpose. Nor does Samsung show how the specification supports such an interpretation.

Still, the language reads as if a comma or word is missing, but the specification helps clarify the term's meaning. Although Figure 1 shows the input into the multiplexer comes from an entropy encoder 113, the claims don't recite that structure. Instead, the term limits how the "coded bitstream" is "obtained"—"by predictive code." And the specification explains that "entropy encoding program code" is classified as "predictive coding program code." *Id.* at 29:8–19. Adding both a comma, a word, and some numbers clarify the term's meaning, which the Court construes as: "the input signal being obtained by multiplexing a coded bitstream, obtained by predictive coding, comprising (1) border motion-vector data and (2) post-quantization data obtained by quantization in the predictive coding."

D. "prescribed" ('995 Patent, Claims 2–4, 11)

ACT's Construction	Samsung's Construction
"predetermined" or "preprogrammed"	Indefinite

The claims use "prescribed" to modify a number of claim terms. *See, e.g.*, '995 Patent at 67:3–5 (reciting, in Claim 2, "implement[ing] a process for a *prescribed* demultiplexing to output at least a first and a second sequence of encoded bits"); *id.* at 67:8–10 (reciting, in Claim 2, "implement[ing] thereon a process for a *prescribed* first decoding to create a sequence of decoded

pictures with a standard resolution"); *id.* at 67:22–24 (reciting, in Claim 2, "implement[ing] a process for a *prescribed* resolution conversion to create a sequence of super-resolution decoded pictures with a standard resolution"). Samsung calls this term indefinite because it has multiple meanings and "the patent does not reasonably clarify which one distinguishes prescribed from non-prescribed processes." Dkt. No. 105 at 8. In fact, it notes ACT's expert "advances several alleged 'plain' meanings" for the term, which shows the term's ambiguity. *Id.* at 8–9.

Samsung's expert opines "it would not make sense to a POSITA to talk about a demultiplexing process that was 'prescribed' versus one that was not, and indeed any specific instantiation of a demultiplexing process would be a 'prescribed' process." Hamami Decl., Dkt. No. 97-9 ¶ 165. Dr. Hamami suggests a skilled artisan "would not know how to ascribe any non-superfluous meaning for 'prescribed' in this context." In other words, Samsung suggests "prescribed" is superfluous.

Assuming, *arguendo*, that to be so, "[t]he preference for giving meaning to all terms . . . is not an inflexible rule that supersedes all other principles of claim construction." *SimpleAir, Inc. v. Sony Ericsson Mobile Commc'ns. AB*, 820 F.3d 419, 429 (Fed. Cir. 2016); *see also Power Mosfet Techs., L.L.C. v. Siemens AG*, 378 F.3d 1396, 1410 (Fed. Cir. 2004) ("[W]here neither the plain meaning nor the patent itself commands a difference in scope between two terms, they may be construed identically."). Thus, even if, as Samsung's expert suggests, "any specific instantiation of a demultiplexing process would be a 'prescribed' process." Hamami Decl., Dkt. No. 97-9 ¶ 165, that alone does not require a holding that the term is indefinite.

Regardless, as Samsung's expert notes, the ordinary meaning of "prescribe" is "to tell someone what they must have or do, or to give as a rule." Hamami Decl., Dkt. No. 97-9 ¶ 164 (quoting The Cambridge Dictionary of American English). This is similar to the meaning of "predetermined" provided by ACT's expert. *See* Kalva Decl., Dkt. No. 97-8 ¶¶ 60–61 (noting a

"POSITA would have understood that in order for a multiplexer to have a 'prescribed' syntax structure, that would simply mean that the syntax structure was predetermined" and that "predetermined" is a synonym for "prescribed"). If something is "prescribed," it must be predetermined. The Court therefore construes "prescribed" as "predetermined" and holds the term not indefinite.

E. "standard resolution" ('995 Patent, Claims 2–4)

ACT's Construction	Samsung's Construction
Plain and ordinary meaning	"the spatial resolution of a picture input as an encoding target"

Samsung contends the patent defines this term, which it says is key to understanding the invention. Dkt. No. 105 at 9 (citing '995 Patent at 2:37–40). ACT, however, disputes any lexicography and contends "[t]he concept of resolution, as it is used in the '995 Patent, is not different than its plain and ordinary usage." Dkt. No. 97 at 12; *see also* Dkt. No. 108 at 4–5 (asserting "[t]he specification merely refers to the input pictures in a specific example of the prior art as having the 'base or standard resolution'"). It criticizes Samsung's inclusion of "spatial" as "unnecessary and confusing," "input" as "superfluous," and "encoding target" as importing a limitation into the claims and cumulative. Dkt. No. 97 at 12–13. Further, it contends Samsung's construction is inconsistent with claims directed to decoders and embodiments in which the spatial resolution of an encoding target is disclosed as "super resolution." *Id.* at 13–14; Dkt. No. 108 at 5.

The Court agrees with Samsung. Rather than referring to a specific resolution as "standard," the patent uses the phrase to mean the starting resolution of the input picture, or the resolution of the moving picture prior to being processed by the invention. As for ACT's complaint the "encoding target" is not required to remain at the standard resolution, Samsung's construction only requires that resolution when the picture is input into an encoder. *See* Dkt. No. 105 at 10 (noting

its construction only requires "that a 'standard resolution' is one with the resolution it had when *input* as an encoding target," and "[i]f the picture's resolution is later enlarged (or reduced), it may remain an 'encoding target' (or 'decoding target')—just not a 'standard resolution' one"). In that regard, "input" and "encoding target" as part of the proper construction address ACT's concerns.

Without construing "standard resolution," a jury might misunderstand that the term refers to a specific resolution (e.g., 1920 lines × 1080 lines, which is standard HD) rather than the resolution of the picture to be encoded. To address that potential confusion, the Court generally adopts Samsung's position and construes "standard resolution" as "the spatial resolution of a picture input into an encoding system as an encoding target."

F. "decoding with an extension of the standard resolution" ('995 Patent, Claims 2–4)

ACT's Construction	Samsung's Construction
"decoding with a non-base spatial layer based on standard resolution reference picture(s)"	Indefinite

Samsung makes two arguments in its challenge to this term. First, it says the phrase "extension of the standard resolution" is unclear. Dkt. No. 105 at 11–12. Second, it says the phrase is non-sensical in light of Figures 23 and 26, and therefore invalid. *Id.* at 12–13.

1. The meaning of "decoding with an extension of the standard resolution"

Despite its burden of showing indefiniteness, Samsung provides little argument concerning the lack of clarity for the term's meaning. Instead, Samsung mainly responds to ACT's opening brief. *See generally* Dkt. No. 105 at 11–12. At most, its expert opines "[t]he term 'extension of the standard resolution' is not a term of art with a definition that is known to a POSITA." Hemami Decl., Dkt. No. 97-9 ¶ 174.

ACT argues a skilled artisan "would have understood that an extension layer is another

phrase used to describe an enhancement layer." Dkt. No. 97 at 14. It argues its construction "highlights what the POSITA would have realized is the purpose of this claimed limitation," which is "allowing a frame to use another frame of a different spatial resolution as a reference frame." *Id.* at 16.

This term is not indefinite on this basis. To start, the patent uses "enhancement layer" and "extension layer" in similar ways. For example, the Background Art section explains that conventional encoding systems use a base layer and an *enhancement* layer. *See* '995 Patent at 1:35–53 (emphasis added). The written description references "a super-resolution picture sequence with the standard resolution belonging to an extension layer referring to the base layer." *Id.* at 60:2–4. The disputed phrase appears within the "second decoder" limitation, which that patent describes as, among other things, "implementing processes for prescribed entropy decoding and inverse quantization, to make a decoding to the state of data on orthogonal transform coefficients at the standard resolution on an *extension layer*." *Id.* at 60:59–63 (emphasis added). While the words and phraseology don't precisely line up, the intrinsic evidence is sufficient to defeat Samsung's challenge. That is, a skilled artisan would be reasonably certain the phrase refers to an "enhancement layer" based on the specification.

2. Whether the claims mix two embodiments in a facially inoperative way

Calling *Trustees Of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359 (Fed. Cir. 2016), "similar" to the present case, Samsung points to the difference in descriptions of Figure 23 and Figure 26, and then notes the claims don't correspond to either embodiment. "[A]s written," says Samsung,

> the claims attempt to generate a "decoding within an extension of the standard resolution" from an input sequence that does not have the "extension of the standard resolution" to decode. Like extracting orange juice from apples is nonsensical, so

too is attempting to decode information from a sequence lack the necessary information.

Dkt. No. 105 at 13 (internal citations omitted)).

Samsung uses colored text to compare the descriptions of the figures:

FIG. 26	FIG. 23
the "second decoder": receives a "sequence of encoded bits obtained with **an extension of the standard resolution** at the demultiplexer"; and performs "decoding being a **decoding with an extension of the standard resolution**, to create . . . **super-resolution pictures decoded with the standard resolution**." '995 Patent at 7:18–48.	the "second decoder": receives a "sequence of encoded bits **with the standard resolution** from the demultiplexer"; and performs "decoding being an **extension decoding at the standard resolution**, to create . . . "**decoded difference data at the standard resolution**." '995 Patent at 52:27–37.

Dkt. No. 105 at 12–13. But the claims, say Samsung, receive FIG. 23's input and "perform the decoding process and generate the output of FIG. 26." *Id.* This mixes distinct embodiments in an incompatible way. *Id.* at 13.

Again, Samsung has not carried its burden. For one, *Symantec* is distinguishable because the court reached its conclusion *after* resolving the scope of both terms at issue. The claim limitation recited "extracting a byte sequence feature from said executable attachment," and the parties disputed whether "byte sequence feature" was limited to information just relating to machine code, as Symantec urged. *Symantec*, 811 F.3d at 1359, 1365. Columbia argued the term "is an umbrella term for the properties or attributes of sequences of bytes that are extracted from any part of an executable, including not only machine code instructions but also other information." *Id.* at 1365. Only after affirming the trial court's construction, which adopted Symantec's position, did the court conclude the claim language was nonsensical. *Id.* at 1366.

Here, however, Samsung makes no meaningful attempt to construe either the disputed term or the input for which it says the output is incompatible. Instead, Samsung, through its expert, attempts to shift the burden to ACT by asserting the intrinsic record doesn't provide guidance as to whether the inputs and outputs are equivalent. But it is Samsung's burden to show they *are not* equivalent or otherwise compatible—not ACT's burden to show they *are* compatible. Samsung has not carried that burden.

The Court construes this phrase as "decoding with an enhancement layer based on standard resolution reference picture(s)."

G. "super-resolution enlarged decoded pictures" ('995 Patent, Claims 2–4, 11)

ACT's Construction	Samsung's Construction
Plain and ordinary meaning	"higher than standard resolution pictures each created using two or more different decoded standard resolution pictures"

This dispute centers on whether "a super-resolution enlarged decoded picture" must be created from a plurality of standard resolution pictures. Samsung calls the intrinsic support for its construction "overwhelming." Dkt. No. 105 at 14. Moreover, citing *In re Abbott Diabetes Care Inc.*, 696 F.3d 1142, 1149–50 (Fed. Cir. 2012), it asserts that the patent implicitly defines the term by how it "repeatedly, consistently, and exclusively" describes "super-resolution." Dkt. No. 105 at 14–15. Finally, Samsung notes its expert's unrebutted testimony in support of its construction. *Id.* at 15. ACT argues that, rather than disputing what a "super-resolution enlarged decoded picture" is, Samsung seeks to limit how one is produced. *See* Dkt. No. 108 at 6.

The Court agrees with ACT. For one, Samsung's reliance on *Abbott* is not persuasive. There, the court considered the scope of "electromechanical sensor" and whether the claims excluded sensors without external cables or wires. The court held "Abbott's patents 'repeatedly,

consistently, and exclusively' depict an electrochemical sensor without external cables or wires while simultaneously disparaging sensors with external cables or wires." *Abbott*, 696 F.3d at 1150. But *Abbott* does not address limiting the scope of a structural term based on how the patent discloses it is produced. At most, Samsung's arguments might limit the steps of a method claim or computer instructions for generating a "super-resolution enlarged decoded picture," but that issue is not before the Court.

Here, without more, the Court cannot limit the scope of the produced picture based on the specification's description of *how* the picture is produced. But because ACT does not otherwise dispute the remainder of Samsung's proposal, the Court construes this term as "higher than standard resolution enlarged decoded pictures."

H. "specify[ing] [the] output frame rate" ('041 Patent, Claim 1, 4, 6)

ACT's Construction	Samsung's Construction
"specify[ing] [the] variable output frame rate"	Plain and ordinary meaning

This dispute concerns the word "variable." ACT says the prosecution history mandates including that word. Dkt. No. 97 at 27–28. Specifically, ACT alleges the applicant distinguished its inventions over a prior-art reference (Iwata) based on that reference's disclosure of a fixed frame rate. *Id.* at 28. According to Samsung, however, that the reference had a 'fixed' frame rate' meant the frame rate could not be *specified*—not that it was "variable." Dkt. No. 105 at 25.

In the referenced Office Action, the examiner cited Iwata ¶ [0046] as disclosing "an output frame rate specification unit configured to specify [the] output frame rate of the first moving image data and [the] output frame rate of the second moving image data that have been input into the moving image data input unit." Office Action (Apr. 23, 2015), Dkt. No. 105-4 at 2. First, the applicant characterized Iwata as

> concerned with playback of video and audio data at various speeds while preserving the intelligibility of the audio. To achieve this, Iwata discloses a method in which a range of acceptable playback speeds are determined based on audio characteristics of the video data, and discloses that decimation or interpolation of the frames is performed based [on] a relationship between playback speed and a shooting frame rate C, a playback frame rate P, and decimation or interpolation N of the video data. Thus, if a "Slow Playback" option in Iwata is selected, the video data will be played back at the slowest speed (e.g., 1/2x or 1/3x the recorded speed) that is possible while maintaining the intelligibility of the audio in that video data, while decimation or interpolation is performed according to the above relationship.

Id. at 2–3 (citations omitted). Then the applicant argued:

> Iwata does **not** disclose an output frame rate specification unit configured **to specify the playback frame rate** of a first video data, and the playback frame rate of a second video data. Instead, the playback frame rate in Iwata is **fixed.** See, e.g., Iwata, paragraphs [0031] ("a playback frame rate is fixed at 60 fps") and [0039] ("Since the playback frame rate is fixed (60 fps)"). In other words, while the playback frame rate of Iwata is a factor in the playback speed relationship discussed above, the **playback frame rate is fixed,** and only **playback speed and decimation or interpolation are changed** for a given shooting frame rate. Playback speed refers to how fast or slow the playback time is compared to the shooting time, and thus does not refer to the playback frame rate, which, in Iwata, is apparently determined by the display device. *See, e.g.,* paragraph [0039] of Iwata. Therefore, Iwata fails to disclose **"an output frame rate specification unit** configured to **specify output frame rate** of the first moving image data and **output frame rate** of the second moving image data that have been input into the moving image data input unit," as recited in claim 1.

Id. at 3 (emphasis in original).

This prosecution argument supports Samsung's position. Specifically, the emphasized language shows the applicant distinguished Claim 1 over Iwata based on the claimed devices' inability to specify the frame rate—not its fixed character. *See id.* At a minimum, this prosecution history is not clear enough to support the disclaimer or disavowal urged by ACT. *See Hill-Rom Servs. v. Stryker Corp.*, 755 F.3d 1367, 1371 (Fed. Cir. 2014) (noting "[t]he standards for finding lexicography and disavowal are exacting"). Accordingly, the Court rejects ACT's construction and will

give this term a "plain and ordinary meaning" construction.

I. "a moving image data input unit configured to be input of first moving image data generated at a first frame rate and a second image data generated at a second frame rate that is different from the first frame rate" ('041 Patent, Claim 1)

ACT's Construction	Samsung's Construction
Governed by 35 U.S.C. § 112 ¶ 6 **Function:** inputting first moving image data generated at a first frame rate and second image data generated at a second frame rate that is different from the first frame rate. **Structure:** imaging unit 100, and external input devices and memory devices such as those identified in 6:45–7:3 (e.g., TV, PC, SD memory card, DVD, Blue-ray Disc, flash memory, wireless modules, etc.) and equivalents thereof	Governed by 35 U.S.C. § 112 ¶ 6 Indefinite

The parties agree this is a means-plus-function term and *appear* to agree on the claimed function,[7] but they dispute whether the specification provides sufficient corresponding structure to avoid an indefiniteness holding. ACT points to the imaging unit 100 of Figure 1 and the disclosure of an external device or stored memory. Dkt. No. 97 at 23 (citing '041 Patent at 6:45–7:3, 7:58–65). Samsung understandably stresses that "moving image data input unit" does not appear in the written description. Dkt. No. 105 at 26. Moreover, says Samsung, ACT's proposed structure doesn't mention frame rates, so a skilled artisan would not recognize the structure and associate it with the recited function. *Id.*

The phrase is not indefinite for lack of corresponding structure. Although the patent never uses the phrase "moving image data input unit," a skilled artisan would nonetheless understand

[7] Samsung does not propose a different "function," nor does it challenge ACT's proposal in its briefing.

from the specification that phrase refers to the "image input controller," "input/output I/F," "card I/F," and "wireless I/F" shown in Figure 1. Fundamental to resolving the dispute is identifying what receives the input, and a skilled artisan would understand that to be the central control unit 300 via the bus 200 so that the subsequent structural limitations can operate on the inputted data.

Samsung's main argument concerns the specification's failure to mention "frame rate" in connection with any of the disclosed structure, much less *two* frame rates. But a frame rate is inherently associated with moving image data; otherwise, the playback mechanism would not know how to properly play back the data. Moreover, the frame rate is immaterial to the input device, and a skilled artisan would not understand, for example, the card interface 211 to be able to provide moving image data having a first frame to the bus and central control unit but not moving image data having a second, different frame rate. Rather, the interface simply provides data from which a moving picture can later be assembled.

That said, the Court disagrees with ACT that the corresponding structure includes the imaging unit 100, external input devices, or memory devices. The recited function is for *inputting* data that already exists, not *generating* the data, and the patent distinguishes between the two. *See* '041 Patent at 2:30–33 (noting the patent teaches "an imaging apparatus and a playback apparatus for *generating* imaging data (moving image data) at different frame rates"); *id.* at 4:65–67 ("The central control unit 300 centrally controls an image capture process described below, that is, a process of *generating* moving image data . . . ."). Accordingly, the Court holds the corresponding structure is "a wireless interface, a card interface, an input/output interface having an input/output terminal connected to an external device, or an image input controller programmed to receive digital image data output from an image A/D conversion unit as imaging data. '041 Patent at 5:28–31, 7:58–65."

J. "an input frame rate specification unit configured to specify the first frame rate of the first moving image data and the second frame rate of the second moving image data, the first and second moving image data having been input into the moving image data input unit" ('041 Patent, Claim 1)

ACT's Construction	Samsung's Construction
Governed by 35 U.S.C. § 112 ¶ 6 **Function:** specifying input frame rates **Structure:** software algorithm that performs the steps of: receiving input moving image data; specifying the first frame rate of the first moving image data input into the moving image data input unit and specifying the second frame rate of the second moving image data input into the moving image data input unit; transmitting the specified input frame rates to the frame rate conversion unit	Governed by 35 U.S.C. § 112 ¶ 6 Indefinite

As with the prior term, the parties agree this is a means-plus-function term and *appear* to agree on the claimed function. But they dispute whether the specification provides sufficient corresponding structure to avoid an indefiniteness holding. Samsung accuses ACT of simply repackaging the claimed function as an alleged algorithm, and stresses ACT's algorithm does not explain how to achieve the function. Dkt. No. 105 at 27. ACT points to Figure 6 and, more specifically, Steps 204–205. Dkt. No. 97 at 25.

The Court agrees with Samsung that ACT's proposed structure simply repackages the recited function, but the phrase is not indefinite. The specification discloses two ways of performing the recited function:

> If first moving image data of the plurality of moving image data is input in step S204, the input frame rate specification unit 303 specifies a frame rate of the moving image data input first (step S205). The method performed based on the image capture frame rate information, the method performed by analyzing moving image

> data to be input, and the like are conceivable as the method for specifying the input frame rate.
>
> In other words, if the image capture frame rate information or information of a similar kind is described in a predetermined data area, or exists as metadata, the input frame rate is specified based on them. On the other hand, if the image capture frame rate information or information of a similar kind is not included, the input frame rate is specified by analyzing the frame configuration of the moving image data.

'041 Patent at 14:7–22. Based on this excerpt, the Court holds the corresponding structure is "a processor programed to, for each of the first moving image data and second moving image data: (1) if the image capture frame rate information or information of a similar kind is described in a predetermined data area, or exists as metadata, the input frame rate is specified based on them; otherwise, (2) the input frame rate is specified by analyzing the frame configuration of the moving image data. '041 Patent at 8:3-9, 14:7-23."

K. "an output frame rate specification unit configured to specify output frame rate of the first moving image data and output frame rate of the second moving image data that have been input into the moving image data input unit" ('041 Patent, Claim 1)

ACT's Construction	Samsung's Construction
Governed by 35 U.S.C. § 112 ¶ 6 **Function:** specifying variable output frame rates **Structure:** software algorithm that performs the steps of: specifying variable output frame rates for each of the first moving image data and the second moving image data that have been input into the moving image data input unit; transmitting specified output frame rates to frame rate conversion unit	Governed by 35 U.S.C. § 112 ¶ 6 Indefinite

Here, too, the parties agree this is a means-plus-function term, but dispute whether the specification provides sufficient corresponding structure to avoid an indefiniteness holding.

Samsung's complaints track those for the prior term—that ACT merely restates the recited function and there is no discussion of how to accomplish the recited "specifying." Dkt. No. 105 at 28. ACT again points to Figure 6. Dkt. No. 97 at 27.

The specification spends more than a column explaining how embodiments of the invention may specify the output frame rate either (1) based on user selection, or (2) based on the setting of an external device that is an output destination. *See generally* '041 Patent at 11:46–12:55. Based on that explanation, the Court holds the corresponding structure is "a processor programmed to, for each of the first moving image data and second moving image data: (1)(a) generate image data on an image that prompts a user to make a selection from among a number of frame rates, (b) display the image on a monitor, and (c) select the frame rate selected by the user as the output frame rate; or (2)(a) acquire, via an input/output I/F or the wireless I/F, information on the frame rate that has been set on the external device side related to the playback of the moving image data, and (b) specify the output frame rate based on the acquired information. '041 Patent at 8:11-48, 11:54-12:40, Figs. 7A, 7B."

L. "a playback speed specification unit configured to specify a same playback speed for the first image data and the second moving image data" ('041 Patent, Claim 1)

ACT's Construction	Samsung's Construction
Governed by 35 U.S.C. § 112 ¶ 6 **Function:** specifying playback speed. **Structure:** software algorithm that performs the steps of: specifying a same playback speed for the first moving image data and the second moving image data; transmitting the specified playback speed to the frame rate conversion unit	Governed by 35 U.S.C. § 112 ¶ 6 **Function**: to specify a same playback speed for the first moving image data and the second moving image data. **Structure**: Software that carries out the following algorithm: 1. Has user selected a playback speed? 2. If so, set playback speed to user-specified playback speed.

The parties agree this is a means-plus-function term, but disagree on the recited function and the disclosed algorithm. ACT again points to Figure 6 and alleges "the algorithm can be based on user selection or a predetermined playback speed." Dkt. No. 97 at 29 (citing '041 Patent at 8:58–9:31). Samsung points to column 9, lines 4–12, for the two steps of its construction. Dkt. No. 105 at 29.

The patent describes the "playback speed specification unit" in two paragraphs. First, the patent explains:

> the playback speed is determined by a relative speed to the normal playback speed. In other words, a case of the same playback speed as the normal playback speed is set to an equal speed, a case of faster playback than the normal playback speed is set to a high speed, and a case of slower playback is set to a low speed.

'041 Patent at 8:64–9:3. The patent then teaches two ways to specify the playback speed—either through user input or predetermination. *Id.* at 13:31–56. Based on that description, the Court holds the corresponding structure is "a processor programmed to: (1)(a) generate image data on an image that prompts a user to make a selection from among a number of playback speeds, (b) display the

image on a monitor, (c) receive the user's selection of one of the number of playback speeds, and (d) set the playback speed of the first moving image data and the second moving image data to the user's selection; or (2) use a predetermined playback speed as the playback speed of the first moving image data and the second moving image data to be output. '041 Patent at 8:58–9:17."

M. "a frame rate conversion unit configured to change a frame rate of the first moving image data based on the first frame rate, the output frame rate, and the playback speed, and change a frame rate of the second moving image data based on the second frame rate, the output frame rate, and the playback speed" ('041 Patent, Claim 1)

ACT's Construction	Samsung's Construction
Governed by 35 U.S.C. § 112 ¶ 6 **Function:** converting frame rates. **Structure:** Software algorithm that performs the steps of: Receiving specified input frame rate and specified output frame rate for each of the first and second moving image data and receiving specified playback speed for both the first and second moving image data; Converting input frame rate to a frame rate that is output, for each of the first moving image data and second moving image data, based on the received specified input frame rate, specified output frame rate, and specified playback speed; Transmitting converted frame rate(s) to the moving image data output unit, for each of the first moving image data and second moving image data, to be output at the converted frame rate(s)	Governed by 35 U.S.C. § 112 ¶ 6 **Function:** to change a frame rate of the first moving image data based on the first frame rate, the output frame rate, and the playback speed, and change a frame rate of the second moving image data based on the second frame rate, the output frame rate, and the playback speed. **Structure:** Software that carries out the following algorithm: 1. Determine if playback speed is low, normal, or high. 2. Apply formula x=Fout/M*Fin to determine change multiplier. 3. If change multiplier is less than 1, then apply decimation to reduce rate by change multiplier. 4. If change multiplier is greater than 1, then apply interpolation to increase rate by change multiplier.

As with the prior term, the parties agree this is a means-plus-function term. Here, however, they disagree on both the recited function and the disclosed algorithm. ACT again points to Figure 6, Dkt. No. 97 at 29–30, and Samsung again accuses ACT of merely restating the claim language, Dkt. No. 105 at 30.

As an initial matter, ACT's proposed function is too broad because it does not specify the inputs required by the language. That is, ACT's proposed function does not require "the first frame rate, the output frame rate, and the playback speed." The Court therefore adopts Samsung's recited function.

As for the corresponding structure, the specification teaches "changing the frame rate of the moving image data to be output by changing the total number of frames of the input moving image data by a known decimation or interpolation method." '041 Patent at 14:27–30. More specifically,

$$F_{out} = x \times M \times F_{in},$$

where F_{out} is the output frame rate, M is the multiplier of the playback speed relative to the equal speed, F_{in} is the specified input frame rate, and x is the change multiplier. *Id.* at 14:31–38. This supports steps 2–4 of Samsung's proposed structure, which the Court generally adopts. Specifically, the Court holds the corresponding structure is "a processor programmed to, for each of the first moving image data and the second moving image data, (1) apply the formula x=Fout/M*Fin to determine the change multiplier; (2) if the change multiplier is less than 1, use decimation to reduce rate by change multiplier; (3) if the change multiplier is greater than 1, use interpolation to increase rate by change multiplier. '041 Patent at 14:23-60."

V. CONCLUSION

Disputed Term	The Court's Construction
"boundary condition" ('025 Patent, Claims 6–7, 10)	"gradient data pertaining to the pixels at the boundary of a block"
"[an estimated video signal] that satisfies Poisson's Equation" ('025 Patent, Claims 6–7, 10)	"[an estimated video signal] for which Poisson's Equation is true"

"the input signal being obtained by multiplexing a coded bitstream obtained by predictive coding, border motion-vector data and post-quantization data obtained by quantization in the predictive coding" ('025 Patent, Claims 6–7, 10)	"the input signal being obtained by multiplexing a coded bitstream, obtained by predictive coding, comprising (1) border motion-vector data and (2) post-quantization data obtained by quantization in the predictive coding"
"prescribed" ('995 Patent, Claims 2–4)	"predetermined"
"standard resolution" ('995 Patent, Claims 2–4)	"the spatial resolution of a picture input into an encoding system as an encoding target"
"decoding with an extension of the standard resolution" ('995 Patent, Claims 2–4)	"decoding with an enhancement layer based on standard resolution reference pictures"
"super-resolution enlarged decoded pictures" ('995 Patent, Claims 2–4)	"higher than standard resolution enlarged decoded pictures"
"specify[ing] [the] output frame rate" ('041 Patent, Claim 1, 4, 6)	Plain and ordinary meaning.
"a moving image data input unit configured to be input of first moving image data generated at a first frame rate and a second image data generated at a second frame rate that is different from the first frame rate" ('041 Patent, Claim 1)	Governed by 35 U.S.C. § 112 ¶ 6 **Function:** "inputting first moving image data generated at a first frame rate and a second image data generated at a second frame rate that is different from the first frame rate" **Structure:** "a wireless interface, a card interface, an input/output interface having an input/output terminal connected to an external device, or an image input controller programmed to receive digital image data output from an image A/D conversion unit as imaging data. '041 Patent 5:28-31, 7:58-65."

"an input frame rate specification unit configured to specify the first frame rate of the first moving image data and the second frame rate of the second moving image data, the first and second moving image data having been input into the moving image data input unit" ('041 Patent, Claim 1)	Governed by 35 U.S.C. § 112 ¶ 6 **Function:** "specify the first frame rate of the first moving image data and the second frame rate of the second moving image data, the first and second moving image data having been input into the moving image data input unit" **Structure:** "a processor programed to, for each of the first moving image data and second moving image data: (1) if the image capture frame rate information or information of a similar kind is described in a predetermined data area, or exists as metadata, the input frame rate is specified based on them; otherwise, (2) the input frame rate is specified by analyzing the frame configuration of the moving image data. '041 Patent 8:3-9, 14:7-23."

"an output frame rate specification unit configured to specify output frame rate of the first moving image data and output frame rate of the second moving image data that have been input into the moving image data input unit" ('041 Patent, Claim 1)	Governed by 35 U.S.C. § 112 ¶ 6 **Function:** "specifying output frame rate of the first moving image data and output frame rate of the second moving image data that have been input into the moving image data input unit" **Structure:** "a processor programmed to, for each of the first moving image data and second moving image data: (1)(a) generate image data on an image that prompts a user to make a selection from among a number of frame rates, (b) display the image on a monitor, and (c) select the frame rate selected by the user as the output frame rate; or (2)(a) acquire, via an input/output I/F or the wireless I/F, information on the frame rate that has been set on the external device side related to the playback of the moving image data, and (b) specify the output frame rate based on the acquired information. '041 Patent at 8:11-48, 11:54-12:40, Figs. 7A, 7B."

"a playback speed specification unit configured to specify a same playback speed for the first image data and the second moving image data" ('041 Patent, Claim 1)	Governed by 35 U.S.C. § 112 ¶ 6 **Function:** "specifying a same playback speed for the first image data and the second moving image data" **Structure:** "a processor programmed to: (1)(a) generate image data on an image that prompts a user to make a selection from among a number of playback speeds, (b) display the image on a monitor, (c) receive the user's selection of one of the number of playback speeds; and (d) set the playback speed of the first moving image data and the second moving image data to the user's selection; or (2) use a predetermined playback speed as the playback speed of the first moving image data and the second moving image data to be output/ '041 Patent 8:58-9:17."

"a frame rate conversion unit configured to change a frame rate of the first moving image data based on the first frame rate, the output frame rate, and the playback speed, and change a frame rate of the second moving image data based on the second frame rate, the output frame rate, and the playback speed" ('041 Patent, Claim 1)	Governed by 35 U.S.C. § 112 ¶ 6 **Function:** "changing a frame rate of the first moving image data based on the first frame rate, the output frame rate, and the playback speed, and changing a frame rate of the second moving image data based on the second frame rate, the output frame rate, and the playback speed" **Structure:** "a processor programmed to, for each of the first moving image data and the second moving image data, (1) apply the formula x=Fout/M*Fin to determine change multiplier; (2) if the change multiplier is less than 1, use decimation to reduce rate by change multiplier; (3) if change multiplier is greater than 1, use interpolation to increase rate by change multiplier. '041 Patent 14:23-60."

The Court **ORDERS** each party not to refer, directly or indirectly, to its own or any other party's claim-construction positions in the presence of the jury. Likewise, the Court **ORDERS** the parties to refrain from mentioning any part of this opinion, other than the actual positions adopted by the Court, in the presence of the jury. Neither party may take a position before the jury that contradicts the Court's reasoning in this opinion. Any reference to claim construction proceedings is limited to informing the jury of the positions adopted by the Court.

SIGNED this 21st day of July, 2024.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE